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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,486	09/26/2006	Tomoaki Ichikawa	2005_1597A	2352
513 7590 03/10/2010 WENDEROTH, LIND & PONACK, L.L.P. 1030 15th Street, N.W., Suite 400 East Washington, DC 20005-1503				
EXAMINER PARSONS, THOMAS H				
ART UNIT 1795		PAPER NUMBER		
NOTIFICATION DATE 03/10/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/552,486

**Applicant(s)**

ICHIKAWA ET AL.

**Examiner**

THOMAS H. PARSONS

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

*The Examiner suggests amending the abstract, as appropriate, to, a single paragraph within the range of 50 to 150 words, and to omit terms such as "said".*

2. The disclosure is objected to because of the following informalities:

page 3, line 16, suggest changing "thee" to --there--.

page 4, line 12, suggest changing "adhered o the" to --adhered to the--.

page 12, line 33, suggest deleting the second occurrence of "a".

page 28, lines 10 and 11" the phrase "work half done" appears awkwardly worded.

Page 29, lines 11-11, the phrase "read the separator into" appears awkwardly worded.

Appropriate correction is required.

### *Claim Objections*

3. Claim 8-10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satsuma et al. (US 2003/0215704) in view of JP 2003-119313 (hereafter JP '313), and further in view of Kobayashi et al. (US 6,802,925).

**Claim 1:** Satsuma et al. discloses an adhesive-carrying porous film for use as a battery separator, which comprises:

a substrate porous film; and

a crosslinked adhesive carried on the substrate porous film, the crosslinked adhesive being prepared by reacting a reactive polymer having a functional group capable of reacting with an isocyanate group therein with a polyfunctional isocyanate so that the reactive polymer is crosslinked (abstract and paragraphs [0005]-[0033]).

Satsuma et al. do not disclose a substrate porous film such that when a probe of a probe penetrating thermomechanical analyzer, the probe having a diameter of 1 mm, is placed on the porous film under a load of 70 g to measure a thickness thereof while heating the porous film from room temperature at a rate of 2°C/minute, a temperature at which the thickness of the porous film decreases to a half of the thickness of the porous film when the probe was initially placed thereon is 200 °C or more.

JP '313 discloses that the substrate porous film is prepared from a polyolefin resin composition comprising a polyolefin resin having a weight average molecular weight of at least 500000 and a crosslinked product of a cross-linkable rubber having double bonds in the molecular chain (abstract and paragraphs [0006]-[0037]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the substrate porous film with the substrate porous film of JP '313 because JP '31' discloses a substrate porous film that would have provided a film having a high porosity and air permeability, high mechanical strength and high heat resistance thereby improving the overall life, integrity and performance of the battery.

The Satsumi et al. combination does not disclose a *partially* crosslinked adhesive.

Kobayashi et al. disclose, in a similar problem solving area (i.e. a partially cross-linked adhesive), a partially crosslinked adhesive wherein a reactive polymer (i.e. a hydroxyl-containing monomer or a carboxyl-containing monomer) into the polymer and the polymer is partially crosslinked by an isocyanate (col. 7: 1-39). *Note that Kobayashi et al. is relied upon solely for its teaching that it is known to partially crosslink adhesive compositions similar to that instantly disclosed.*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the adhesive of Satsumi et al. by incorporating the partially crosslinked adhesive of Kobayashi et al. because Kobayashi et al. teach a cross-linked adhesive that is partially crosslinked to adjust the cohesive power of the adhesive layer thereby improving the overall life and integrity of the adhesive-carrying porous substrate film.

Further, because the substrate porous film of JP '31' is similar to that instantly claimed is obviously would provided the claimed a temperature at which the thickness of the porous film decreases to a half of the thickness of the porous film when the probe was initially placed thereon.

**Claim 2:** The rejection is as set forth above in claim 1.

**Claim 3:** The rejection is as set forth above in claim 1 wherein Satsuma et al. further disclose that the reactive polymer has carboxyl groups or hydroxyl groups as the functional group capable of reacting with an isocyanate group (paragraph [0012]).

**Claim 4:** The rejection is as set forth above in claim 1. Because the adhesive-carrying porous film of the Satsumi et al. combination is similar to that instantly claimed, the film would obviously a gel fraction in a range of 5 to 80%

**Claim 5:** The rejection is as set forth above in claim 1 and 2 wherein JP '313 further discloses that the cross-linkable rubber is an ethylene-propylene-ethylidene norbornene ternary copolymer (paragraph [0046]).

**Claim 6:** The rejection is as set forth above in claims 1 and 2 wherein Satsuma et al. further disclose that the cross-linkable rubber is a polynorbornene (paragraph [0046]).

**Claim 7:** The rejection is as set forth above in claim 1 wherein the Satsuma et al. combination discloses an electrode/porous film laminate comprising an electrode press-contacted to the adhesive-carrying porous film.

**Claim 8:** Claim 8 recites an electrode/porous film adherend comprising an electrode bonded (press-contacted) to a porous film prepared by reacting a reactive polymer in the

electrode/porous film laminate with a polyfunctional isocyanate and further crosslinking a partially crosslinked adhesive.

The Satsumi et al. combination as set forth above in claim 1 and 7 reverses the order. The Satsumi et al. combination discloses a porous film prepared by reacting a reactive polymer in the porous film laminate with a polyfunctional isocyanate and further crosslinking a partially crosslinked adhesive followed by bonding (press-contacted) an electrode to the porous.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have reversed the order if making the laminate as it has been held that the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results.

Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re Gibson, 39 F.2d 975, 5USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.)

**Claim 9:** Claim 9 recites charging the electrode/porous film laminate as claimed in claim 7 into a battery container and then pouring an electrolytic solution containing a polyfunctional isocyanate therein into the battery container; and heating the laminate to react an unreacted reactive polymer in the partially crosslinked adhesive carried on the porous film with the

polyfunctional isocyanate to further crosslink the reactive polymer thereby bonding the electrode to the porous film to form an electrode/porous film adherend and obtaining a battery which has as a separator the porous film in the electrode/porous film adherend thus formed.

The Satsumi et al. combination as set forth above in claim 1 and 7 reverses the order.

The Satsumi et al. combination discloses heating the laminate to react an unreacted reactive polymer in the partially crosslinked adhesive carried on the porous film with the polyfunctional isocyanate to further crosslink the reactive polymer thereby bonding the electrode to the porous film to form an electrode/porous film adherend, and the subsequently charging the electrode/porous film laminate into a battery container.

However, as set forth above in claim 8, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have reversed the order if making the laminate as it has been held that the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results.

**Claim 10:** Claim 10 has been construed as a product by process claim wherein the process limitations impart structure to the battery. The Examiner has construed the claim as a battery comprising:

an electrode/porous film laminate as claimed in claim 7;  
battery container into which is place the electrode/porous film laminate;  
electrolytic solution placed into the battery container,

an electrode bonded to the porous film to form an electrode/porous film adherend and obtaining a battery which has as an electrode/separator adherend the electrode/porous film adherend, wherein the porous film is made of a polyolefin resin composition comprising a



polyolefin resin having a weight average molecular weight of at least 500000 and a crosslinked product of a cross-linkable rubber having double bonds in the molecular chain.

***Examiner Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS H. PARSONS whose telephone number is (571)272-1290. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas H Parsons/  
Examiner, Art Unit 1795

/PATRICK RYAN/  
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